UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/672,182	09/28/2000	Antoine Drouot	PHF 99.584	9178

24737 7590 09/13/2004

PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
HESSELTINE, RYAN J	

ART UNIT	PAPER NUMBER
2623	

DATE MAILED: 09/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/672,182	Applicant(s) DROUOT, ANTOINE
	Examiner Ryan J Hesseltine	Art Unit 2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. In view of the appeal brief filed on July 6, 2004, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

3. Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

4. Claim 9 is objected to because of the following informalities: claim 9 states, "A computer-readable storage medium comprising a software module **for** storing a set of instructions..." (emphasis added). This is indefinite because it implies that the storage medium is blank or has something else stored thereon and is simply capable of storing a set of instructions for performing the claimed method steps. Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-3 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Jayant et al. (USPN 5,473,384, previously cited, hereafter Jayant).

7. Regarding claims 1 and 8, Jayant discloses method of processing data which represent a sequence of pictures, previously encoded and decoded and a filtering device carrying out the method, comprising the steps of: examining pixels within a picture of said sequence to detect (classify) edge pixels and non-edge pixels (column 6, line 63-column 7, line 20); choosing pixels from among the detected non-edge pixels a pixel to be filtered (Figure 6, numeral 146 and 150; column 8, line 45-54); replacing the chosen pixel (center of 3x3 filter window) with a pixel value that is selected from among said chosen pixel and at least one pixel of said pixels within a picture in immediate vertical, horizontal, or diagonal adjacency (3x3 filter window inherently includes 8 pixels immediately adjacent the center pixel) with said chosen pixel (Figure 2; column 8, line 54-column 9, line 2, line 18-21).

8. Regarding claim 2, Jayant discloses that the selected pixel is the median pixel of a set having an odd number of members from among said detected non-edge pixels (3x3 filter window contains 9 members), at least one of said odd number of members being said chosen (center) pixel, said odd number of members comprising said at least one pixel in immediate vertical, horizontal, or diagonal adjacency (Figure 2; column 8, line 54-column 9, line 2, line 18-21).

9. Regarding claim 3, Jayant discloses that the method is applied to the luminance (intensity) component of the pixels of said picture (column 6, line 31-39).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-4, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Acharya et al. (USPN 6,229,578, previously cited, hereafter Acharya).

12. Regarding claims 1, 8 and 9, Acharya discloses method of processing data which represent a sequence of pictures, previously encoded and decoded, a filtering device carrying out the method, and a computer-readable storage medium comprising a software module storing a set of instructions (column 13, line 45-61), comprising the steps of: examining pixels within a picture of said sequence to detect edge pixels and non-edge pixels (column 5, line 12-32); choosing pixels from among the detected non-edge pixels a pixel to be filtered (column 5, line 33-44; column 9, line 66-column 10, line 14); replacing the chosen (center) pixel with a pixel value selected from among said chosen pixel and at least one pixel of said pixels within a picture in immediate vertical, horizontal, or diagonal adjacency with said chosen pixel (column 10, line 15-35; column 11, line 17-28). It is noted that the values of neighboring pixels are subjected to an averaging process so that the average values are inputted to the median filters instead of the actual pixel values, but the examiner believes that removing this step and directly using the values of the neighboring pixels would not change the overall operation of Acharya's invention.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the chosen pixel with a pixel value selected from among said chosen pixel and at least one pixel of said pixels within a picture in immediate vertical, horizontal, or diagonal adjacency with said chosen pixel as taught by Acharya in order to subject edge pixels and non-edge pixels to different noise removal techniques to avoid the problem posed by median filtering of blurring and decimating edge features by applying the median filter only to non-edge pixels (column 5, line 33-44).

13. Regarding claim 2, Acharya discloses that the selected pixel is the median pixel of a set having an odd number of members from among said detected non-edge pixels, at least one of said odd number of members being said chosen (center) pixel, said odd number of members comprising said at least one pixel in immediate vertical, horizontal, or diagonal adjacency (Figure 5; column 9, line 66-column 10, line 35).

14. Regarding claim 3, Acharya discloses that the method is applied to the luminance (intensity) component of the pixels of said picture (column 5, line 45-60).

15. Regarding claim 4, Acharya discloses that a pixel is detected as an edge pixel if a magnitude representative of a gradient of the pixel is greater than a predetermined threshold (column 5, line 12-18).

16. Claims 4 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jayant as applied to claim 1 above.

17. Regarding claim 4, Jayant discloses the use of gradients and thresholds (column 8, line 10-33) but does not explicitly disclose that a pixel is detected as an edge pixel if a magnitude representative of a gradient of the pixel is greater than a predetermined threshold. The examiner

takes Official Notice that edge detection using gradient thresholds is well known in the art of image processing. It would have been obvious to one of ordinary skill in the art at the time the invention was made to detect a pixel as an edge pixel if a magnitude representative of a gradient of the pixel is greater than a predetermined threshold in order to quickly and accurately determine which pixels are located at edges, and which pixels are not located at edges.

18. Regarding claim 9, Jayant does not disclose a computer-readable storage medium comprising a software module for storing a set of instructions executable under the control of a computer or a processor. The examiner takes Official Notice that it is well known in the art to adapt a processing method to be stored on a computer-readable storage medium as instructions executable by a computer or a processor. It would have been obvious to one of ordinary skill in the art at the time the invention was made to adapt the method of claim 1 to be stored as executable instructions on a computer-readable storage medium in order to allow a computer or processor to execute the method steps.

19. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jayant as applied to claim 4 above, and further in view of Gupta et al. (USPN 5,852,475, previously cited), hereafter Gupta.

20. Regarding claims 5 and 6, Jayant does not disclose that a pixel is detected as an edge pixel if the horizontal (or vertical) component of a gradient of said pixel is greater than the vertical (or horizontal) component of said gradient and if the modulus of said gradient is greater than both the modulus of the gradient of the adjacent pixel on the left (or lower pixel) and the modulus of the gradient of the adjacent pixel on the right (or upper pixel). Gupta discloses a transform artifact reduction process wherein a plurality of different Sobel-based operators are

used to determine edge directions within a three-by-three windows surrounding a pixel of interest (column 16, line 19-53). Gupta further discloses combining the plurality of spatial gradients to obtain the center pixel gradient by weighting different pixels within the window (column 16, line 54-column 17, line 42). Gupta does not explicitly state that the modulus of said gradient is compared with the modulus of the gradient of the adjacent pixels, but it is inherent that if a pixel is detected as an edge that the pixels on either side of that edge will have a gradient magnitude less than that of the pixel lying on the edge. It would have been obvious to one of ordinary skill in the art at the time the invention was made to detect horizontal and vertical edges as taught by Gupta in order to generate a pixel texture estimator for each of the possible edges in a three-by-three window using weighting based on Sobel operators which has been widely tested and reported as providing good performance (column 17, line 9-24).

21. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jayant as applied to claim 1 above, and further in view of Gupta et al. (USPN 5,852,475, previously cited, hereafter Gupta).

22. Regarding claim 7, Jayant does not disclose that a pixel is filtered if the number of edge pixels in a defined neighborhood of the pixel lies within a defined range. Gupta discloses a transform artifact reduction process including a continuous non-edge check 901 which determines whether enough non-edge pixels are present in the three-by-three window (which inherently includes a certain number of edge pixels within a defined range) including the current pixel to perform further directional-filtering without filtering an edge pixel (column 21, line 23-28). It would have been obvious to one of ordinary skill in the art at the time the invention was made to filter a pixel if the number of edge (and non-edge) pixels in a defined neighborhood of

the pixel lies within a defined range as taught by Gupta in order to ensure that at least a certain number (three) of pixels in the current window are edge (or non-edge) pixels so that a continuous line of non-edge pixels may exist through the window, and to prevent a situation where any one-dimensional filter along any possible axis through the current window from including an edge pixel (column 21, line 29-37).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan J Hesseltine whose telephone number is 703-306-4069. The examiner can normally be reached on Monday - Friday, 8:30 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ryan J. Hesseltine
September 10, 2004

JINGGE WU
PRIMARY EXAMINER